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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,539	04/01/2004	Justin K. Brask	ITL.1137US (P19148)	9991

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TROP PRUNER & HU, PC  
8554 KATY FREEWAY  
SUITE 100  
HOUSTON, TX 77024

EXAMINER
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GOUDREAU, GEORGE A

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 09/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/816,539	Applicant(s) BRASK ET AL.	
	Examiner George A. Goudreau	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 April 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14, 16 and 18-20 is/are rejected.
- 7) ☒ Claim(s) 15, 17 and 21 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

*George A. Goudreau*  
**GEORGE GOUDREAU**  
**PRIMARY EXAMINER**

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5, 7, 12-13, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Watanabe et. al. (5,256,247).

Watanabe et. al. disclose a process for wet etching a CrSiO<sub>2</sub> layer (i.e.-a metal layer/ a semiconductor layer) on the surface of a wafer using a patterned etch mask, and a wet etchant. The wet etchant is comprised of HF-H<sub>2</sub>O-PEG. The PEG reduces the amount of undercut of the etched layer during the etching process by increasing the viscosity of the wet etchant. This is discussed specifically in columns 7-8; and discussed in general in columns 1-8. This is shown in figures 1-2.

It would have been inherent that the polyethylene glycol (i.e.-PEG) which is added to the aqueous solution of HF would absorb water in the solution, and thereby dehydrate the solution. The examiner cites the case law listed below in this regard.

In re Swinehart (169 U.S.P.Q. 226 (CCPA )) and In re Best (195 U.S.P.Q. 430 (CCPA )) state that when an examiner has reasonable basis for believing that functional characteristics asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be inherent characteristics of the prior art, the examiner possesses the authority to require an applicant to prove that the subject matter shown to be in the prior art does not possess the characteristics relied upon.

Thus, all of applicant's claimed limitations are fully met in this regard.

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3. Claims 1-5, 8-14, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Mitsubishi (JP 51-123,739).

Mitsubishi discloses a process for wet etching trenches in Si (i.e.-a metal layer/ a semiconductor layer) using a patterned etch mask, and a wet etchant. The wet etchant is comprised of HF-HNO<sub>3</sub>-H<sub>2</sub>O-additive. The additive may be either ethylene glycol or glycerol. The additive is used to reduce the amount of undercutting of the Si trenches during the wet etching process by increasing the viscosity of the wet etchant. This is discussed specifically in the abstract; and discussed in general on pages 217-218.

It would have been inherent that the additive which is added to the aqueous solution of HF-HNO<sub>3</sub> would absorb water in the solution, and thereby dehydrate the solution. The examiner cites the case law listed above of interest to the applicant in this regard. Thus, all of applicant's claimed limitations are fully met in this regard.

4. Claims 1-5, 8-13, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Inoue et. al. (JP 01-270,232).

Inoue et. al. disclose a process for wet etching a layer of InSb (i.e.- a metal layer/ a semiconductor layer) on the surface of a wafer using a patterned photo resist etch mask, and a wet etchant. The wet etchant is comprised of FeCl<sub>3</sub>-H<sub>2</sub>O-propylene glycol. The glycol which is added to the wet etchant reduces the amount of undercutting of the etch of the InSb layer over that which occurs in an aqueous solution of FeCl<sub>3</sub> without the propylene glycol. This is discussed specifically in the abstract; and discussed in general on pages 147-149. This is shown in figures 1-3.

It would have been inherent that the propylene glycol which is added to the aqueous solution of  $\text{FeCl}_3$  would absorb water in the solution, and thereby dehydrate the solution. The examiner cites the case law listed above in this regard. Thus, all of applicant's claimed limitations are fully met in this regard.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 6, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied in any of paragraphs 2-4 above.

The references as applied in paragraphs 2-4 above fail to disclose the following aspects of applicant's claimed invention:

- the specific dipping of the substrate in the wet etchant in order to wet etch the targeted layer to be etched; and

-the specific wet etching process parameters which are claimed by the applicant

It would have been obvious to one skilled in the art to dip the substrate which is to be etched into a bath of the wet etchant in any of the wet etching processes which are taught above based upon the following. The wet etching of a substrate by dipping the substrate into a wet etch bath is conventional or at least well known in the etching arts. (The examiner takes official notice in this regard.) Further, the specific usage of such a method to wet etch a substrate simply involves the usage of an alternative, and at least equivalent means for wet etching a substrate.

It would have been prima facie obvious to employ any of a variety of different wet etching process parameters in the wet etching process taught above including those which are specifically claimed by the applicant. These are all well known variables in the wet etching art, which are known to effect both the rate and the quality of the wet etching process. Further, the selection of particular values for these variables would not necessitate any undue experimentation, which would have been indicative of unexpected results.

Alternatively, it would have been obvious to one skilled in the art to employ the specific wet etching process parameters which are claimed by the applicant in the wet etching process taught above based upon *In re Aller* as cited below.

"Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F. 2d 454, 105 USPQ 233, 235 (CCPA).

Further, all of the specific process parameters which are claimed by the applicant are results effective variables whose values are known to effect both the rate, and the

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quality of the wet etching process.

8. Claims 15, 17, and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

10. Any inquiry concerning this communication should be directed to examiner

George A. Goudreau at telephone number (571)-272-1434.

  
George A. Goudreau  
Primary Examiner  
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